CONFERENCE OF THE COMMITTEE ON DISARMAMENT

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Work Program regarding negotiations on prohibition of chemical weapons

I. INTRODUCTION

This paper sets forth some of the considerations that are relevant to the question of prohibition of chemical weapons. It deals primarily with lethal chemical warfare agents. The paper does not attempt to treat all of the many factors which we or others may feel are important with respect to these agents or offer final judgements on those questions that are discussed. The delegation hopes that the material presented will stimulate further discussion and assist the Committee towards reaching a consensus regarding those considerations that are important to successful negotiations.

II. SCOPE

This section (A) sets forth major categories of types of agents and precursors describing a number of factors which appear to the US delegation relevant to their consideration in the context of arms limitation, (B) describes possible ways of defining substances that might be controlled, and (C) sets forth and discusses classes of activities pertaining to chemical weapons programs together with relevant arms limitation considerations.

A. Major categories of substances related to chemical warfare include the following:

1. Single-purpose agents. These agents have no large-scale uses except in chemical warfare. Modern agents in this category, such as organophosphorus compounds, are extremely toxic. Some older agents, which caused a number of deaths in World War I, also fall into the "single-purpose" category.

2. "Dual-purpose" agents are chemicals which are commonly used for civilian purposes, but which might also be used as CW agents. Phosgene, chlorine, and hydrogen cyanide are well-known examples of substances in this category and were

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utilized widely in the first World War. The extent of the civilian uses of these agents was described in a working paper (CCD/283) submitted earlier by the US delegation.

3. Precursors. Intermediates of modern agents may or may not have civilian applications. Phosphorus trichloride, for example, a key precursor in the production of organophosphorus nerve agents, is widely used as an intermediate in the manufacture of pesticides and plasticizers. Under present conditions, agent intermediates do not assume immediate military significance until processed further into an agent, but binary devices, by using agent intermediates as weapons components, could blur this distinction.

B. Definitions of Controlled Substances

The following general criteria offer various possibilities for defining chemical substances which might be used for chemical warfare:

1. General Toxicity Standard. Modern lethal agents are in general much more toxic to humans than are pesticides or other chemicals used in the civilian sector. A standard related to the toxicity of present-day nerve agents would exclude, for all practical purposes, chemicals which have civilian uses. However, allowance should be made for the fact that a number of super-toxic compounds have legitimate medical applications. If a toxicity standard were adopted it might be necessary to provide for a uniform laboratory method of determining the toxicity of a compound. The kind of animals to be used, their number and weight, the method of application of the chemical, and extrapolation of effects to humans, are among the factors which would have to be dealt with. Questions regarding the application of a toxicity standard might be referred to an international consultative body or some other appropriate international body.

2. Identification of Specific Agents. Many chemical substances which have been used in warfare or developed for weapons purposes are generally known. Although a comprehensive list of these known agents by name and specific structural formula might include the majority of agents in current arsenals, there is no way at present to know whether such a list would include all the major agents in the arsenals of states or under development.

3. General Structural Formula. All presently identified nerve agents are organophosphorus compounds which exert their toxic effect by inhibition of the enzyme acetylcholinesterase. Considerable information is available on the relationship between chemical structure and ability to inhibit acetylcholinesterase. A general structural formula might be developed which would describe the spectrum of organophosphorus compounds which could be used as lethal agents but would not include compounds used as pesticides. One possibility is the formula presented in CCD/320 by the delegation of the Netherlands.

4. Criterion Based on Purpose. The Biological Weapons Convention relies on a general formulation which prohibits agents "of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes". This definition is both comprehensive and simple. Such a definition by itself, however, could be insufficiently precise for effective application to chemicals which are produced in extremely large quantities for peaceful purposes.

5. Combination of Methods. Having various possible prohibitions in mind, the Committee might consider what combination or combinations of criteria could be appropriate. The advantages might be weighed of using a purpose criterion, accompanied by one or more of the other forms of definition described above. If differing prohibitions were to be considered for various categories of agents, definitions would be needed which could distinguish such categories from one another. For example, with respect to prohibitions covering the most lethal types of agents, a definition might include, in addition to a purpose criterion, reference to structural formulas of known agents and specification of toxicity levels. Binary components, however, may not be readily distinguishable from many industrial chemicals either by their structural formula or toxicity. If such intermediates were to be considered, because of their potential military importance, for specific prohibitions, it might be desirable to consider a definition that was based on the

purpose criterion and a list of known substances. There are, of course, advantages and disadvantages to all of the various possible definitions and their combinations, which should be carefully considered by the Committee as it moves forward in its work on questions concerning CW prohibitions.

6. Maintaining Effective Definitions. The Committee might consider ways in which definitions could be kept current. Examples of possible technological developments which could affect the adequacy of definitions in future circumstances are:

(a) Development of very toxic chemicals with non-military uses;

(b) Development of binary weapons with "dual-purpose" chemical components;

(c) Development of non-military uses for substances similar to present nerve agents;

(d) Development of chemical compounds which have potential military utility but which do not clearly meet traditional criteria for determining controlled substances. In view of these possibilities, consideration might be given to the most appropriate means for continuing or periodic future consultations to help insure that the scope of substances to be controlled remains effectively defined, with updating as necessary.

C. Scope of Activities Which Might Be Controlled

The Committee should give consideration to the various classes of activities pertaining to chemical weapons programs together with relevant arms limitation factors.

1. Production of Agents is a key element in acquiring and, over the long run, in maintaining a chemical warfare capability. The current process of manufacture of modern lethal agents is a sophisticated one carried out in highly specialized facilities. These characteristics give rise to important considerations bearing on the question of nerve agent production controls:

(a) Initiating nerve agent production is a complex task. Considerable time is required to construct a new agent plant, convert another chemical facility to agent production, or even to reactivate an agent plant which has been shut down for more than a short period. The engineering difficulties which must be overcome are considerable. The cost of establishing a nerve agent manufacturing facility of the type used in the past is many times greater than for a production facility for commercial chemicals. These considerations may not be fully applicable in the case of production of components for binary weapons.

(b) While it may be reasonable to assume that there are relatively few chemical facilities which might be used at the present time to make organophosphorus chemical warfare agents, information is insufficient to determine which facilities in fact have this capability and have been engaged in agent production.

In the case of nerve agent production facilities, possibilities for demilitarization range from closing or "mothballing" plants to conversion or destruction. Measures which might be useful in ensuring that required actions were taken are discussed below in the verification section.

2. Production of Weapons

(a) Chemical munitions manufacture uses substantially the same type of metal-processing facilities used to make casings for conventional weapons. Filling of munitions with agent, on the other hand, characteristically is a highly specialized process carried out under stringent safety and security controls. The filling of chemical munitions with nerve agent would normally be carried out at or near the agent production facility, where appropriate conditions for handling highly toxic materials would already exist. This would be a lesser consideration in the filling of munitions using less toxic materials such as chlorine, phosgene or possible components of binary weapons.

(b) In considering possible approaches to prohibiting production of chemical weapons, the question of munitions might assume varying importance depending on the nature of the agents being utilized:

(i) Dual-Purpose Agents. A great many countries would, of course, continue to possess production facilities for, and large quantities of, such chemicals as chlorine and phosgene for peaceful industrial uses after any chemical weapons agreement. Such production facilities, or current stocks, could be utilized at anytime for making weapons. Thus the activity which it seems most relevant to restrict in this area would be production of munitions rather than production of agents.

(ii) Nerve Agents. On the other hand, in the case of known nerve agent munitions, the agents themselves do not have large-scale peaceful uses, and their possession in any quantity, even when not filled in munitions, has military significance. Thus, controls affecting production of agents would appear to be of particular importance in connexion with such weapons as those using nerve agents.

3. Stockpiling. Possession of stocks of chemical weapons is essential to maintenance of an immediate chemical capability. While there is evidence which suggests the existence of substantial quantities of chemical arms in present day arsenals of several nations, storage of chemical weapons by its nature is not a readily identifiable activity. Several considerations seem pertinent in relation to stockpiling:

(a) There is general uncertainty over the size and composition of chemical weapons stocks in existence.

(b) A capability to retaliate promptly in kind to a chemical attack is one deterrent against initiation of chemical warfare.

(c) Destruction or demilitarization of stocks, given the toxic nature of modern agents, requires time-consuming and carefully controlled processing under stringent safety precautions. To ensure that none of the toxic agent escapes into the invironment, a destruction facility must be operated under the principle of "total containment". Another major concern is the disposal of the end-products of the agent destruction. These end-products, while relatively non-toxic in themselves, might have a serious adverse effect if introduced into the environment in large quantities.

4. Research and Development

(a) Research. Certain lethal agents were an accidental by-product of industrial insecticide research conducted in civilian laboratories. It may be difficult to tell from the nature of research on toxic substances whether or not such research is part of a military programme. It may also be difficult to distinguish many aspects of research for offensive purposes from research for defensive or prophylactic purposes. At the same time, it is possible that a number of countries will attach importance to the continuation of research for defensive purposes.

(b) Development of promising CW agents and of means for disseminating them are explicitly military activities and go beyond the stage necessary for design of defensive measures. However, development, like research, is an activity of low visibility.

III. VERIFICATION

The Committee faces a number of important questions with respect to possible means of verification, both national and international. This section sets forth a number of considerations (A) on the relationship between the scope of prohibitions and verification, and (B) regarding the feasibility of possible specific verification elements such as (1) seals and monitoring devices, (2) information exchange, (3) declarations, (4) remote sensing devices, (5) inspection visits, and (6) monitoring of imports and shipments of certain specific materials.

A. Relationship Between Verification and Scope

Various possible combinations of CW prohibitions would be likely, in order to be effective, to require various measures of verification. Comprehensive prohibitions would, by definition, most completely limit chemical warfare capabilities. Moreover, comprehensive prohibitions, by covering many aspects of CW activities, would tend to reinforce each other. On the other hand, there may be some factors which would warrant the Committee's consideration of the relative merits of a phased approach in which some activities are prohibited initially and other activities at subsequent stages. For example, a simultaneous prohibition of production of certain agents or weapons, together with a requirement for complete destruction of any existing stocks of those agents or weapons, might require a higher degree of

assurance of compliance than if prohibitions were placed initially on production alone. As indicated earlier, possession of a retaliatory CW capability has been generally considered to provide one deterrent to the first-use of chemical weapons by others. A state possessing chemical weapons could feel that it required a very high degree of assurance that others would be taking the same steps it was to take, before agreeing to prohibitions which, when implemented, would leave it with no ability to retaliate promptly. Thus, one possible way some states might be satisfied with a somewhat lower level of initial assurance would be if the disarmament process took place in stages, that is, in the example under discussion, if production of certain classes of agents or weapons were prohibited initially while destruction of stockpiles were to take place in a subsequent stage.

B. Verification Elements

1. Seals and Monitoring Devices. The possibility exists of assuring that CW activity does not take place at "mothballed" facilities through the use of seals or monitoring devices of the types which have been studied in connexion with nuclear safeguards. This possibility has particular relevance with respect to a phased process in which CW production facilities are shut down but not initially dismantled. During the last session of the CCD, the delegation of the United States submitted a working paper (CCD/332) which describes the nature and possible utility of sealing and monitoring devices.

2. Information Exchange. Given the complexity, and the prospects for growth and change in the chemical industry throughout the world, provisions for information exchange might play a useful role in verifying chemical weapons limitations. Consideration might be given in the Committee to the types of information which would be helpful. Possibilities might include information regarding: (a) quantity, types, and uses of organophosphorus products; (b) quantity, types, and uses of dual purpose chemicals; and (c) intended use of major new chemical production facilities.

3. Declarations. Two types of declarations which might be considered in connexion with chemical weapons prohibitions are:

(a) Declarations Regarding Activities. The Committee might examine the utility of periodic declarations regarding activities relevant to an agreement as one means to help reinforce implementation of an agreement. For example, annual statements by parties, having the effect of affirming their compliance with an agreement, might be considered. The Committee might examine whether declarations which set forth annual national production figures for substances limited by an agreement would offer to parties an additional degree of assurance of continuing observance of an agreement. In the case of a prohibition of nerve-agent production, for example, it would be expected that parties would register zero production or a very small amount destined for scientific research. To emphasize a party's continuing commitment to an agreement, such declarations might be endorsed or issued at the highest governmental level.

(b) Declarations of Facilities. Declarations might also be considered that could be helpful in increasing the effectiveness of various means of verification. For example, submission by parties of lists identifying and locating facilities capable of handling highly toxic materials would be of help in verifying prohibitions of production. What types of facilities might be included in such lists, and whether the lists should contain supplemental information regarding past and present activity at particular installations, could be a subject to be examined within the Committee.

4. Remote Sensing Devices. The question of possible utility of remote sensing devices to detect evidence of CW activity is being studied in various countries. The present level of sensor technology, however, does not appear to offer significant prospects, in the near future, for the development of long-range sensors that could detect evidence of the manufacture or storage of chemical agents. The two principal problems in this respect are the difficulty of achieving sufficiently great sensitivity over large distances and the fact that substances resulting from prohibited and non-prohibited activities may give closely similar readings.

5. Inspection Visits. The Committee should consider possibilities for on-the-scene verification, including such questions as how locations to be visited are chosen and what might be expected to take place during a visit. An on-the-scene inspection by technically qualified personnel may be the most efficient and direct way of resolving a serious question concerning implementation of chemical prohibitions at a given site.

6. Monitoring of Imports and Shipments. Certain chemical substances have limited commercial application. A disproportionate increase in imports or shipments of these materials might be significant in verifying observance of an agreement.

IV. INTERNATIONAL ORGANIZATIONAL CONSIDERATIONS

A number of questions pertaining to international organizational considerations could have possible relation to measures containing prohibitions on chemical weapons. This section discusses (A) possible consultative arrangements, (B) relationship to the Security Council of the United Nations, and (C) the usefulness of provisions for periodic review. The consideration of these questions, as well as those in part V below, would of course be significantly affected by the manner in which questions in the preceding sections, pertaining to scope and to verification, were handled.

A. Consultative Body

In assessing which approaches to the achievement of restraints on chemical weapons are promising and which are not, consideration might be given, at an appropriate stage in the work of the Committee, to whether establishment of a standing consultative body would be helpful and, if so, what its role might be. While recent multilateral arms control agreements have not established or defined special roles for a body of this sort, a consultative group might be able to perform constructive functions in connexion with an agreement on chemical weapons. Given the complexities and difficulties of CW verification problems, provision for a consultative body might offer some additional element of assurance to potential parties to an agreement. Participation in the consultative body of appropriate governmental, military, and scientific representatives might in itself establish increased international confidence, understanding, and co-operation in dealing with problems inherent in the implementation of restraints on CW.

1. Possible Functions.

(a) One function of a consultative body might be to keep abreast, through the participation of appropriate military and scientific experts, with the military potential of various advances in chemistry. Such a function on the part of a consultative body might be particularly relevant if a chemical weapons agreement defined controlled substances using such criteria as a general toxicity standard and/or identification of specific agents. A consultative body might perform the function of reviewing questions regarding new chemical substances and of making such determinations as whether a particular commercially produced substance (i) fell within an agreed toxicity or formula criteria, (ii) should be classified as single-purpose or as dual-purpose, (iii) should be considered a precursor; and whether in light of these assessments the substance should be classified as one controlled or proscribed by the relevant definitions.

(b) Another possible role which might be considered for a consultative body could be in helping to assure parties to a treaty that its provisions were being carried out. Such a body might, for example, be the recipient of reports from parties to a treaty regarding their compliance with its provisions for destruction of existing stocks of lethal chemical agents and chemical weapons. It might also receive information reports on the intended use of organophosphorus substances produced by parties and on the use of certain categories of existing and new chemical production facilities. A consultative body might also receive questions from parties regarding implementation or observance of the CW agreement. In this connexion the consultative body might be the locus for arranging inspection visits to clarify an ambiguous situation and to restore confidence that an agreement was being observed.

2. Organizational Considerations.

(a) Operations. It would be necessary to consider in advance of determining whether to establish a consultative body the way in which it might perform the functions expected of it. Attention would need to be devoted to questions such as the powers that a consultative body might have to initiate actions, to make recommendations, and to solicit the co-operation of parties in the resolution of any problems that might arise. It would also be necessary to consider such practical questions as funding, headquarters, staff, and types of services to be provided. Parties to an agreement would naturally wish to avoid unnecessary costs in implementing any agreements in the CW area and would not wish to establish a new international organization or assign new functions to an existing organization unless substantial benefits could be expected in the solution of problems involved in implementing the agreement.

(b) Membership. The question of membership and participation in such a consultative body would be an important one for potential parties to an agreement. One possibility might be to agree that representatives of all parties to a CW agreement would be entitled to participate in any consultative body concerned with the implementation of that agreement. However, a consultative body might itself determine how experts would be selected for participation in its various activities.

(c) Relationship to Existing Organizations. Since a consultative body might be concerned with a range of issues varying from use of chemical substances for agricultural purposes to questions involving security and political issues, the relationship of such a body to existing international organizations might also be

considered. It might be useful to consider what ties a consultative body would need to have with such offices as the United Nations Secretary-General or with the United Nations Security Council, the United Nations General Assembly, or United Nations specialized agencies, and how these might best be provided for.

B. Relationship to the Security Council

A number of recent arms limitation treaties have contained provisions which specifically recognize the pre-eminent role of the United Nations Security Council in dealing with matters affecting international peace and security. In view of the important security implications any new agreement restricting chemical weapons would have, members of the Committee may wish to consider whether it would be of value to reaffirm in an appropriate manner the right of parties to submit complaints of violation to the Security Council together with all possible evidence, and to set forth an undertaking by parties to co-operate in carrying out any investigations the Security Council might initiate.

C. Review Conference

The Committee might weigh the advantages of a periodic review conference as an additional means of assuring the continued effectiveness of a CW agreement. A review conference could conduct a broad examination of whether the purposes and principles of the agreement were being realized, taking into account particularly any new scientific and technological developments relevant to the agreement. The discussion of issues and problems at a review conference could be of assistance to the subsequent work of any consultative body. Preparations for a review conference could be entrusted to a consultative body, if one had been established.

V. OTHER QUESTIONS

A number of other questions could arise in the course of consideration of possible prohibitions relating to chemical weapons. These might include (A) relationship to the Geneva Protocol, (B) facilitation of international co-operation in the field of peaceful applications, (C) prohibitions of assistance to third parties with respect to proscribed activities, (D) entry into force, (E) duration and withdrawal, and (F) amendments.

A. Relationship to the Geneva Protocol

In connexion with the achievement of any new restrictions on chemical weapons a question will naturally arise as to the relationship between these restrictions and existing restraints in the Geneva Protocol. Committee members may therefore wish to

consider whether any new agreement on chemical weapons should contain provisions noting the importance of the Geneva Protocol and ensuring that nothing in the agreement could be interpreted as in any way limiting or detracting from obligations assumed under the Geneva Protocol.

B. Facilitation of International Co-operation

In view of the fact that restraints on chemical weapons will have an important bearing, directly or indirectly, on activities in peaceful scientific and industrial areas, the Committee may wish to consider whether it would be practical and desirable for any new prohibitions to be accompanied by provisions that make clear the intention of parties to co-operate with other states or international organizations in the further development and peaceful application of science in fields relating to the agreement. Provisions along these lines are contained in both the Biological Weapons Convention and the Treaty on the Non-Proliferation of Nuclear Weapons. It would, therefore, seem logical to consider the desirability of appropriate provisions in the case of restraints on chemical weapons.

C. Assistance to Third Parties

Since parties to any new agreement would be accepting restrictions on their activities, it would seem logical to consider the possibility of appropriate provisions pursuant to which parties would agree not to assist or encourage any others to carry out activities limited by the new agreement. Such provisions, which have been included in recent multilateral arms control agreements, would reinforce the achievement of the broad purposes of any new agreement.

D. Entry Into Force

The question of how additional limitations on chemical weapons enter into force is important because a new agreement would affect weapons of established military significance. The Committee could consider whether a relatively large or a relatively limited number of ratifications ought to be necessary before a new agreement would enter into force. This question could have relationship not only to the possible scope of a new agreement but also to the manner in which questions such as duration and withdrawal are handled.

E. Duration and Withdrawal

The manner in which the questions of duration and withdrawal are handled in any new chemical weapons agreement will have a relationship to the possible scope of any new prohibitions and the extent of reassurance provided to parties through agreed means

of verification. These issues are in turn related to such questions as the overall stability of any new agreement and the extent of capability remaining in the hands of any nation to deter the initiation of chemical warfare by others. Approaches to the question of duration could range from consideration of an agreement limited to a fixed number of years (with possibilities of continuation or renewal), to an agreement of indefinite duration. Intermediate approaches might also be envisioned. Procedures for withdrawal could also vary, in part depending upon whether duration was limited or indefinite.

F. Amendment

Procedures for amendments could assume particular significance in the case of chemical weapons prohibitions. Chemical weapons and agents relate to a field of science and technology which is rapidly expanding and which may undergo basic changes in the future. Thus, technical aspects of prohibitions formulated in the light of technology existing in one decade could be significantly different in another decade. Whether amendments should be relatively easier or more difficult to adopt could also be related to the manner in which the issue of duration was handled.